THE CLASSICAL SYSTEM FOR NAMING

An older system for naming ions of multi-valent metals uses the latin name for the element with an "ic" suffix for the larger charge and an "ous" suffix for the smaller charge. This system is only used for the multi-valent metals listed below:

Ion	IUPAC name	Classical Name
Au^{1+}	Gold(I)	Aurous
Au^{3+}	Gold(III)	Auric
Pb^{2+}	Lead(II)	Plumbous
Pb^{4+}	Lead(IV)	Plumbic
Cu^{1+}	Copper(I)	Cuprous
Cu^{2+}	Copper(II)	Cupric
Fe^{2+}	Iron(II)	Ferrous
Fe^{3+}	Iron(III)	Ferric
Sn^{2+}	Tin(II)	Stannous
Sn^{4+}	Tin(IV)	Stannic
Hg^{1+}	Mercury(I)	Mercurous*
Hg^{2+}	Mercury(II)	Mercuric
Sb^{3+}	Antimony(III)	Stibnous
Sb^{5+}	Antimony(V)	Stibnic

* Latin is not used for mercury.

Example 1): Give both the IUPAC and Classical name for :

a) Fe_3N_2 b) $Cu(NO_3)_2$

Answers:

a) IUPAC iron(II) nitride Classical ferrous nitride
b) IUPAC copper(II) nitrate Classical cupric nitrate

EXERCISE D

1. Give both the IUPAC and Classical names for the following:

a) Cu_2S b) $FeCl_2$ c) SnO_2
d) AuN e) PbS_2 f) $Hg_2Cr_2O_7$
g) $Cu_2S_2O_3$ h) $Sn(NO_3)_4$ i) Au_2CrO_4

2. Write the formula for the following:

a) plumbic chloride b) ferrous sulfate
c) mercuric nitrate d) stannous chlorite
e) cupric oxide f) plumbous nitride

NAMING MOLECULAR COMPOUNDS

Recall that molecular compounds consist of two non metals bonded covalently. Greek numerical prefixes are used to communicate the number of atoms in the formula. Learn the following prefixes:

prefix	meaning
mono	1
di	2
tri	3
tetra	4
penta	5
hexa	6
hepta	7
octa	8
ennea	9
deca	10

In general, mono is never used on the first atom and no prefixes are used for hydrogen.

NOTE: For molecular compounds, O.N.'s are not directly involved in formula writing or naming.

Example 1) Name the following molecular compounds:

a) CS_2 b) NI_3 c) N_2O d) P_4O_{10}

Answers:
a) The formula contains one C and two S. The name is carbon disulfide
b) The formula contains one N and three I. The name is nitrogen triiodide
c) The formula contains two N and one O. The name is dinitrogen monoxide. Note that the "o" in mono is dropped with oxide.
d) The formula contains four P and ten O. The name is tetraphosphorus decaoxide.

Some elements exist only in a molecular form. They are summarized below:

Diatomics H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2 (MEMORY AID - These are all of the "gens")

Others P_4, S_8

Exercise E

1) Name the following molecular compounds:

a) CO_2 b) NO_2 c) SO_3 d) SF_6

2) Write the formula for each of the following:

a) carbon monoxide b) sulfur dioxide
c) dinitrogen tetroxide d) phosphorus trichloride